

IN THE DRAWINGS:

Fig. 18 has been amended to transpose numerals 46 and 48.

Fig. 17 has been amended to add an extra lead line to numeral 45 leading to another passage opening.

REMARKS

Claims 1 through 16 are in this application and are presented for consideration. Claims 1 and 4 have been amended, and new claims 9 through 16 have been added.

The claims and drawings have been amended to address the Examiner's objections, and to place the application in better form. Applicant thanks the Examiner for the careful reading of this application, and for pointing out discrepancies.

In the office action, claim 1 line 11 is objected to for the term "said discharge opening" having insufficient antecedent basis. Applicant notes that original claim 1 in line 7 sets forth "a discharge opening". It is applicant's position therefore that line 11 has proper antecedent basis.

Claims 1 through 8 have been rejected as being anticipated by Auer.

Claim 1 sets forth a displacement piston being closed at a lower end. In the embodiment of the present drawings, the displacement piston is represented by reference 40. As one can see from the present figures, especially figures 8 and 17, the lower end of the displacement piston 40 is closed. The rejection does not indicate which structure in Auer is equated with the displacement piston of the claims. Applicant has reviewed Auer, and finds no teaching nor suggestion of any displacement piston having a closed lower end. Applicant notes that the structure inside the upper end of bellows 12 in Auer is not equivalent to the displacement piston of the present claims, since this structure inside bellows 12 is not closed on a lower end. Applicant finds no other description of any other structure in Auer which it would be equivalent to the displacement piston of claim 1.

It appears that the bottom of the structure inside the bellows 12 of Auer must be open

in order for product to pass out of the bellows 12. Applicant finds no incentive nor motivation to modify Auer to have this structure be closed at the bottom. It's applicant's understanding that closing the bottom of the structure of Auer, would change the principal of operation of Auer. Therefore it is applicant's position that the displacement piston of claim 1 is not anticipated nor obvious in view of Auer. Claim 1 defines over Auer since all the features of claim 1 are not present nor suggested.

Claim 1 also sets forth that the displacement piston is provided with a passage opening in an upper area of the pump chamber. In the embodiment of the drawings, this passage is represented by reference 45, especially shown in figures 16 and 17. The rejection does not indicate what structure in Auer anticipates the passage opening of the displacement piston in an upper area of a pump chamber. Applicant finds no teaching nor suggestion in Auer of a passage opening in a displacement piston in an upper area of a pump chamber.

As described above, the structure inside the upper area of bellows 12 in Auer, appears to have an opening at the bottom end thereof. However this opening at the bottom end is not in an upper area of a pump chamber. From figures 3 and 4 of Auer it appears that the bottom end of this structure is arranged in the middle of the bellows when it is at its uppermost position, and the bottom end of this structure is at the bottom end of the bellows when it is at its lowermost position. Therefore the bottom opening of the structure inside the bellows 12 of Auer is not similar to the passage opening in the upper end of the pump chamber of claim 1.

Claim 1 therefore further defines over Auer.

New independent claim 9 also sets forth a displacement piston. The displacement piston

in claim 9 is set forth as having a closed first end. Applicant finds no teaching nor suggestion in Auer of a displacement piston having a closed end. As described above, the structure inside bellows 12 of Auer appears to have an open bottom end. Applicant also notes that the top end of this structure in Auer appears to be open. Therefore this structure in Auer cannot anticipate the displacement piston of new claim 9. As also described above, applicant finds no incentive nor motivation in the prior art to modify the structure of Auer to have a closed end. It is applicant's position that new claim 9 therefore defines over Auer.

Claim 9 also sets forth that the piston defines a passage opening at the second end of the pump chamber. Applicant finds no teaching nor suggestion of any piston structure in Auer which defines a passage opening at an end of a pump chamber. Applicant further notes that the second end of the pump chamber is set forth in claim 9 as being diametrically opposite the suction valve. If element 10 of Auer is equated with the suction valve of the present invention, there is clearly no passage opening in an end of a pump chamber that is diametrically opposite element 10 in Auer. Claim 9 therefore further defines over the prior art.

The feature of the passage opening being at the upper end of the pump chamber, or at the end opposite the suction valve, is significant for repetitively dispensing a precise amount of product. Applicant has found that when a passage opening is at a lower end of a displacement piston, air can become trapped in a pump chamber above the passage opening. The volume of air that becomes trapped is variable and therefore changes the amount of product which is pumped. By the present invention having the passage opening at an uppermost end of a pump chamber, little or no air is trapped and therefore there is little or no variation in the amount of

product being pumped.

The closed bottom end of the piston forces the product through the upper passage openings, and also forces any air to be removed. The closed bottom end is therefore also advantageous for dispensing a precise amount of product.

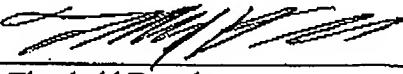
The present invention is an improvement over pumps such as Auer, since the pumps of the present invention dispense a more precise amount of product. The disadvantage of prior art pumps such as Auer is discussed in the background portion of the present specification. It is only the present application which discloses how the prior art pumps trap air, and how this causes imprecise volumes to be dispensed. The present invention further defines over the prior art because of the present invention being the only one to discover the cause of imprecise dispensing, and for finding a solution.

The present invention provides a pump which is simple in design, rugged in construction and economical in operation. It is applicant's position that the present invention is an improvement over prior art pumps and therefore worthy of patent protection.

If the Examiner has any comments or suggestions which would further favorable prosecution of this application, the Examiner is invited to contact Applicant's representative by telephone to discuss possible changes.

At this time Applicant respectfully requests reconsideration of this application, and based on the above amendments and remarks, respectfully solicits allowance of this application.

Respectfully submitted
for Applicant,

By: 

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Attached: (1) Replacement Sheet of Drawings

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